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1893.

A short historical sketch of the labours of the Imperial Russian Technical Society, from its foundation to Jan. 1st. 1893.

ST. PETERSBURGH.
Printed by R. Golicke 17, Spasskaia Street.
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Дозволено цензурою. С.-Петербургъ, 4 Августа 1893 года.

The Russian Technical Society, ushered into existence through the endeavours of 11 persons, known as its founders, at a period of increased activity in the construction of a system of Russian railways; dates its foundation from 1866, when its Rules received the Imperial sanction April 22nd. From May 24-th of that year it commenced operations and on the 22-nd April 1874 it was honored with the title of Imperial. Conformatory with its Rules, its chief aim is co-operation with a view to the welfare of technical men and technical occupations in Russia.

The means for attaining these ends are pointed out to it by:

1) Readings, conferences, & public lectures on technical subjects;

2) The dissemination of theoretical and practical knowledge through periodical and other publications;

3) assisting the propagation of technical education;

4) proposing technical questions especially those bearing on internal industries and awarding prizes and medals for the best solutions of them;

5) the organisation of exhibitions of handiwork and manufacturer's wares;

6) the investigation of materials used in mills and factories, productions and special modes of working employed in Russia, either of the society's own selection, or at the request of other societies or private individuals;

7) the formation of technical libraries and, in proportion to its means, chemical laboratories and technical museums;

8) negociating between technical men and persons requiring their services;

9) co-operating to assist the sale of insufficiently known native products;

10) intercessioning the Government for laws and measures that are deemed will have an influential effect upon the development of technical industries in Russia.

The Society was originally subdivided into 4 sections, viz.

I Section — Chemical products and Metallurgy.

II Section — Mechanical technology, mechanics and machine construction.

III Section — Building and mining arts and architecture.

IV Section — Shipbuilding, naval engineering ordnance and rifle manufacture.

In 1867 the Society commenced the publication of the memoirs of its proceedings, which is still continued.

On May 15-th, 1868 at Permanent Commission on Technical Education was instituted among the members which since 1884 issued its proceedings, at first under the title of the «Proceedings of the Commission» now altered to «Technical Education». Subsequently the following four Sections were added to the Society in the following rotation:

V Section — Photography, founded April 22nd, 1878. From May 1880 until April 1884 this Section issued its own organ «The Photographer» at other periods both before and since, the proceedings of the Section are included in the Memoirs of the Society.

VI Section — Electricity, founded January 19, 1880; from its very commencement has issued its special journal «Electricity».

VII Section — Aeronautics, founded December 20 1880.

VIII Section — Railway Engineering, founded January 31st 1881. From February of the same year it has published its own weekly Journal «Railway Affairs».

In accordance with the Rules of the Society, its members are divided into honorary, effective, amateur and corresponding members. These may be Russians or foreigners, either local residents or otherwise.

Honorary members are persons elected who have rendered some particular service in a technical sphere or an important assistance to the Society, or done something that may tend to considerably influence its welfare.

Effective members: Anyone occupied in any technical profession or craft is eligible for election as an Effective member. They may, if so disposed, belong to several Sections... All founders are Effective members by virtue of right.

Amateur members, are those who do not come under the above category but who take an interest in the subjects studied by the Society. Corresponding members are elected from among provincial and foreign members, whose services to the society are acknowledged to be of advantage. Members of whatever category are elected by ballot at General Meetings, in the presence of not less than 30 effective or honary members, in which cases: Honorary members are proposed by the Council and elected by a majority.

Effective members are elected by a majority of not less than two thirds.

Person desirous of becoming candidates for election as Effective members must be proposed by five members, which proposal is then considered by the respective Sections as well as the Council. To this proposal must be appended detailed information of the technical works and capabilities of the proposed candidate.

Amateur members are elected on the proposal of three members and an ordinary majority of votes. Upon election an effective member pays an entrance fee of 10 roubles and a yearly subscription of 10 Rbls. Amateur members pay the entrance fee and an annual subscription of 20 Rbls. It is optional for either to substitute the annual subscription fees by a single one of 100 Rbls in the case of effective members and 200 Rbls in that of Amateurs; which payment consitutes life members.

Corresponding members are proposed by the Council and elected by a majority of two thirds. Honorary and Effective members are entitled to vote upon all questions at General Meetings; Amateur members can only vote at the election of the President, the vice-president or Amateur members and in domestic economy; Corresponding members have no right of vote.

Each Section of the Society has a President elected from amongst its members for two years, also a Vice-President, who acts in the absence of the former, and a Committee of from 10 to 20 persons elected annually from among the members of the particular Section.

Not less than one fifth of the total number of members resident in St. Petersburg are to be present at either of such elections, when an ordinary majority is deciscive.

Affairs relating to each individual Section are examined by the President, Vice-President and members of Committee of the same, in corpore.

The permanent Commission on technical education forming the IX Section, act under similar conditions but have separate Rules sanctioned by Supreme Authority May 25, 1882 which however only differ slightly in details.

The permanent Commission for instance has, in addition to a President. several Vice-Presidents.

The President and Vice-Presidents of the Commission are elected from among the members of the Commission, upon its recomendation, by the Council of the Society with the approbation of a General Meeting of the Society and are conformed in that office by the Minister of Public Education, the first for 3 and the second for 2 years.

The Commission retains a Secretary.

The head of the Imperial Russian Technical Society is the President who is elected from among the honorary and effective members of the Society for a term of 3 years.

Such elections are preceeded by the sending in of names of Candidates by each individual member.

The three persons who receive the greatest number of recommendatory signatures are put up for vote by ballot by the members present at a General Meeting and the one receiving the largest number of votes above a half of the number of voters present, is considered elected. Besides the said President, the Society is at liberty to have an Honorary President.

The Vice-President and Secretary of the Society are also elected for 3 years — the former from its honorary and effective members, the latter from its effective members.

These elections take place under the same conditions as the election of the President of the Society merely with this difference, that the persons recommended to fill the above posts are proposed by the Council, as well as the members themselves in parties of not less than 20, and the names of the candidates thus proposed are publised 2 months previous to the election.

The general affairs of the Society are managed by the Council consisting of the President, Vice-President and Secretary of the Society as well as the Presidents and Vice-Presidents of the several Sections.

Finally the chief administration of the affairs of the Society is invested in the General Meeting.

Each Section is bound to hold a meeting, consisting of its President or Vice-President and members of committee, at least once every month.

In order that the decisions of such meetings be valid, at least two thirds of the other members, besides the Chairman, must be present. In cases of necessity, a general meeting of a separate Section or conjointly with other or several general meetings of separate Section may be convened.

The Council sits not less than twice in each month. In order to ensure the validity of its decisions it is requisite that, in addition to the President and Secretary of the Society, there should be present the Presidents or Vice-Presidents of at least 6 Sections, whereof one shall be from the Section to which the question in hand has reference.

In cases of urgency General Meetings of the Council and Sections combined are appointed.

The General Meetings are ordinary and extraordinary.

The former are held once in each month, the latter as appointed by the Council in urgent cases which will not admit of postponement.

At General Meetings propositions brought forward by the Council or members are discussed and confirmed, Committees are appointed for auditing the annual reports, the estimates of receipts and expenditure and programmes of the proposed year's work in the Society, the said accounts, estimates and programmes, as well as instructions framed by the Council are ratified and officers and members are elected.

For the validity of such decisions only a majority of those present is necessary, the attendance however is required of not less than one fourth of the resident members in St. Petersburg.

Decisions relative to alterations and additions to the Rules require the opinion of at least one half of all the members of the Society and a majority of two thirds of their votes, including those of provincial members, for whose, declarations a three months term is appointed.

Indepent of the official meetings of all the organisations of the Imperial Russian Technical Society here enumerated, it is compulsory, according to the Rules that conversaziones of a technical character be appointed, not less than once each week duly observing the order of each Section. In reality these conversaziones take place oftener.

The parent Society in St. Petesburg has a Library, a Technical Museum, a Chemical Laboratory, a Physical Station and a Photographic Studio with a staff of servants attached thereunto for the proper management of them and spacious premises with a large Hall specially constructed for exhibition purposes, in which it frequently holds it own or lets it to others for holding exhibitions conformable to the aims of the Society.

The Society's Library is open daily to all members and in 1892 for instance, it received 175 Russian and foreign technical periodicals.

Such is the organization of the central or parent Society, but in addition to this it has its branches in the form of local Sections of the Imp. Russ. Tech. Soc. founded sucessively in different towns of Russia on the type of central Sections, but with various forms of instructions dependent upon the special conditions of the locality.

The foremost among these branches is the Caucassian Section, founded in Tiflis in the commencement of 1868; it publishes its own organ under the title of Memoirs of the Caucassian Section of the Imperial Russian Technical Society.

After this sprang up in succesion the

Kieff Section which also issues its own Memoirs since 1871.

Novorossisky Section in Odessa from the commencement of 1871 and also issues it own Memoirs since 1886.

Moscow Section since May 22nd, 1876.

Baku Section since May 19th, 1879 which since 1880 has its own organ entitled the «Proceedings of the Baku Section of the Imperial Russian Technical Society.

Kazan Section on November 3nd, 1879.

Kharkoff Section on December 5th, 1879.

Nishigorod Section since December 16th, 1879 which since 1887 employs the «Steam Navigation and Industrial Messenger» as its special organ.

Esthonian Section in Reval from June 29th, 1881.

The Sections of Turkestan in Tashkent, Dombroff, Don in Rostoff on the Don, and that in Perm, were all founded abont the middle of 1890.

At the present time the following new Sections are on the point of being opened: the Ekaterinoslav. Cronstadt and Bessarabian in Kishinev.

In 1868, previons to any of these, the East-Siberian Section was founded, but ceased to exist in 1878.

The Ural Section, founded October 17th 1868, ceased to exist in 1878.

Nicolaieff Section was founded April 7th. 1869, was closed on April 3nd, 1874 but is about to be reopened.

Ivan-Vosnesensky Section founded January 9th, 1871, ceased existance in 1882, steps are however being taken for re-opening it.

In their turn all these local Sections are divided into special sub-sections.

The activity of the Imperial Russian Technical Society is developed in an extraordinary diversity of forms:

It discusses or studys at its meetings, or in special sub-committees, questions of a technical character evoked by the requirement of the times, or brought under its notice by the Government or public institutions and private individuals; organizes technical discussions and public lectures, co-operates in the organization of various congresses and exhibitions, concocted with a view of developing technical occupations and industries in Russia, sometimes it forms them by its own direct orders, makes adjudications and distributes honorable awards in the form of medals, diplomas etc. It uses its influence in the publication of manuals and text-books, offers and distributes premiums and issues its own publications both periodical and in book form.

Besides premiums which are awarded from a special fund, H. I. H.

the Heriditary Grand Duke Nicolai Alexandrovitch has placed at the disposal of the Society a special annual premium of 600 Rbls for awarding to authors of the most prominent Works touching upon subjects entering into the domain of the Imperial Russian Technical Society.

The chief medal of the Society is its large bronze one awarded in recognition of special services. Only 12 of such medals have been given viz:

In 1872 — to H. S. Voinitsky for his exertions in connection with the building of the Society's premises.

In 1879 — to P. N. Yablotchkoff for his invention in electric lighting.

In 1880 — to Baron A. Delvitch, the Society's first President, upon the attainment of his 50th year's service in the rank of an officer.

In 1880 — to P. A. Kotchubey having filled the chair of President to the Society for 10 years.

In 1880 — to Baron Nordenschöld for his discovery of the Sea trading route through the Artic Ocean.

In — 1880 — to V. N. Tchikaloff for his labours in the Science of Electricity.

In 1882 — to V. M. Karlovitz for organizing the Physical Station.

In 1883 — to E. N. Andreeff for his labours on behalf of Technical Education.

In 1887 — to N. C. Bunge for services rendered to the Society.

In 1887 — to Admiral K. N. Posiett on the occasion of his 50th years service in the rank of an officer.

In 1889 — to N. V. Isaakoff on the occasion of his 50th years service in the rank of an officer.

In 1891 — to T, K. Velichko on the occasion of his 10 years Presidentship of the VI Section.

Besides its own medals the Society also presented the gold ones conferred by H. I. H. the Heriditary Grand Duke to be awarded in his name for special works or services.

Thus at the exhibition of illuminating materials and appliances in 1888 a gold medal was offered by the Heriditary Grand Duke for the best literary production — and was awarded to N. P. Petroff for his work on lubricating oils; besides this.

2 gold medals in the name of the Heriditary Grand Duke were presented in 1890.

1) to A. Nebolsen — for services at Exhibitions and Conventions.

2) to I. A. Anopoff — for services at the exhibition and for his literary work «Essay on the systematic review of materials for ascer-

taining the present state of the middle and lower standard of technical and professional education in Russia.

The Society's other medals, which are awarded to exhibitors at exhibitions upon recomendation of the judges for superior exhibits, are of gold, silver and bronze. Altogether more than one hundred have been presented.

Besides the above, more than 70 persons have had H. I. M. Supreme rewards bestowed on them.

The work of the Society generally, can be divided into two categories: one which is fulfilled by the entire Society in conjunction or with the assistance, where possible, of all its members, the other which is carried ont by its special sections or branches or by separate Committees.

To the most prominent labours of the first category during the 26 years of the Society's existance, ending in 1893, the following may be ascribed:

The active part taken by the Society in the National Exhibition of Manufactures in 1870 by the exhibition of it collections and chiefly by the organization of public lectures, excursions to mills and works and the organization of a Convention of Russian mill owners and manufacturers in conjunction with various Societies for the development of Russian industries and trade.

The foundation, in the early part of 1870 of a Technical Museum.

The organization of the Russian Section of the Universal Exhibition in London, also of many others, and arranging the nescessary collections for them.

Active part in various international congresses, conventions and exhibitions, for instance in Philadelphia and other towns, also at the national exhibition in Moscow in 1882.

The arrangement in 1875 at St. Petersburg of a convention of the Chief workers in machine constructing industries, such as: machine builders, owners of metallurgical works, representatives of railway, steamboat, gas and water companies, mills and undertakings using the products of metallic works, dealers in machinery and metallic wares used in building, engineers and others engaged in corresponding branches of industry, members of the Imperial Russian Technical as well as those of other societies engaged in the consideration of economical and industrial questions.

The organisation in 1882 of a convention of members of the Imperial Russian Technical Society at Moscow.

The organization, in 1890 in St. Petersburg, of a convention on

technical education, during the exhibition of technical schools in St. Petersburg 1889.

The organisation of an exhibition of fire-extinguishing appliances, articles for fire-brigade equipment etc. also a convention of persons interested in the question of precautionary means againt fire in 1892 in St. Petersburg.

The compilation and publication in detail of the proceedings of the above mentioned four great Conventions, which have obtained a widespread importance in furtherings schemes concerning these branches of Russian Industries and her workers touched upon by them.

The consideration of means for the introduction of the metric system of weights and measures.

Investigation of the question upon the adoption of means for the removal of sewage from towns.

Enquiries into the question concerning inventions and patents.

To the number of prominent labours of various Sections of the Society during that period, the following may be assigned:

I Section. The organisation in 1887—1888 of an exhibition in St. Petersburg, of lighting and heating appliances and products of naphta in connection with competions for improved lamps and naphta stoves and heaters.

Devising a type for a lamp to consume heavy mineral oils.

The organization in 1885 in St. Petersburg of a Convention of starch manufacturers and starch merchants.

Trials and researches with naphta illuminants and lubricating oils.

Researches anent the question of conduits for naphta.

Investigation of steel and its mode of manufacture.

Labours and researches concerning the elasticity of gases.

Testing and Investigating the calorific power of coals.

II Section: — the organisation of exhibitions of machinery and mechanical appliances in St. Petersburg in the years 1875 to 1880.

Assistance in the organization of a Convention of builders of machinery and deliberation of means for the development of machine building in Russia.

Participation in the framing of rules relating to steam boilers.

Investigating and testing petroleum motors.

III Section — the consideration of various questions relating to railways (previous to the foundation of the VIII Section).

Work in connection with the question of ventilation and heating.

Enquiries into the best means for the laying of underground sewers in towns and, at the same time, at the request of the Municipal

Councils, schemes for sewage works in St. Petersburg and Moscow also for supplying Moscow and Theodocia with water.

The formulation of conditions for the testing and receiving of cements.

Testing steel used in the manufacture of rails commenced in 1884, and is still in progress.

Researches on the subject of irrigation.

Enquiries into means for the improvement of fluvial navigation.

By the IV Section. Participation in the organization of a Military section of the museum of practical sciences.

The organization in 1886, of an exhibition of sportsmens guns and fowling pieces.

The publication of a treatise on mercantile shipbuilding.

The consideration of measures for improving shipbuilding by private enterprize.

In the V Section. The organization of three photographic exhibitions in St. Petersburg in 1888, 1889 & 1891.

The formation in 1892 of a course of instruction in photography.

The organization of readings and lectures on photography.

Publication of the «Photographer» also a collection of articles on photography.

The consideration of questions relating to instruction in photography.

Participation in the organization of the exhibitions on galvanoplastic.

The consideration of questions relating to laws of copyright.

Investigations in gelatine emulsion processes.

In the VI Section. The organization of four electrical exhibitions in 1880, 1881, 1886 and 1891 in St. Petersburg.

The formulation of rules for those using electric currents

The consideration of various technical questions relating to electrical engineering.

In the VII Section. The development of questions regarding the practice and theory of æronautics.

Compilation of a code of observations of balloon ascensions in connection with meteorology.

In the VIII Section. The consideration of various special questions upon the construction and exploring of railways and among others with a view to the classification of railways according to types, maintainence, working expenditure and exploitation.

On the heating of railway carriages.

On the lighting of » »

The drawing up of a programme of lectures upon railways given at the Institute of Engineers of the ministry of ways and communications.

On the preservation of wood, and especially wooden sleepers, from decay.

On the permanent way and railroads of the second type.

Labours upon the question of the Grand trunk line of railway across Siberia.

In the IX Section (Committee upon technical education) Intimate labours in the preparatory business and organization of a convention upon technical education in 1890.

Consideration of the question of the lower, middle and upper standards of technical and also of female proffessional education.

The foundation of a school for machine—driver's and special artizan's children.

The institution of classes for workmen.

Administrative work in connections with schools.

Schools on the above plans founded and maintained at the present time in St. Petersburg.

Special ones 3.

Trade school for smiths and fitters.

School for builder's foremen and a

School for the printers craft

Schools for the general education of workmen's children (of both sexes) 18 with 1446 scholars.

Proffessional school for womens handiwork 1 with 25 pupils.

Evening classes for adults, male and female 12 (one of these is situated in Reval), which are attended by 717 persons.

Besides which it grants pecuniary assistance to 3 private proffessional schools for females.

A more detailed account of the labours of the Committee on technical education and of the schools under its supevision is inserted in a separate notice appended hereunto.

As far as regards the Provincial Sections of the Society they always take a lively interest in the investigation of various technical questions pre-eminently of local importance. For instance, as the most prominent labours and services of these sections, may be mentioned the researches on the question of irrigation, by the Caucassian section and enquiries relating to the naptha industry, by the Baku section; the organization of an industrial exhibition in Tashkent in 1891 by the Turkestan section the organization, in 1891 of a photographic exhibition in Odessa by the Novorossick section also the institution and

maintainace of a school for builder's foremen, material assistance ever being given to the Nishnigord section of the steel-smiths trade among the peasantry of the Novgorod district, supplying them with steel of a superior quality at a moderate price, organizing a museum of specimens of that trade and a technical school in Paul's village, the organization of an industrial, exhibition of artizan's and farming produce, the foundation, in 1881, in the section itself of a technical Museum for the sale of wares of local artizans, taking steps to procure legislatory powers for of the question on the inspection of steam boilers the holding of a whole course of public lectures annually, enquiries into various questions relating to sugarbaking, by the Kiev section; this being one of the chief branches of industry in that district, the annual publication of highly interesting notes and articles relating to this industry in a separate book form under the title of «The Year book.» and the organization in 1884 of special technical classes on beet-sugar manufactory. In a word the provincial sections having their own libraries and museums and render a deal of assistance to the local districts, gratis. Several of them have already founded and maintain their own technical schools and occupy their own private premises.

A separate sketch of the Kiev section will be found in the appendix.

The number of publications on the work of the Imperial Russian Technical Society is far from being small, as, in addition to the already enumerated periodical Journals of the Society:

The Memoirs of the Imperial Russian Technical Society.

The Journals: «Electricity».

«Railroad Affairs».

«Technical Education».

as well as the various organs of the provincial sections previously mentioned, — the Society have excecuted the following special publications:

1) The proceedings of the convention of Chief persons engaged in machine building industry (1875).

2) The proceedings of the commission for enquiring into the condition of machine building in Russia and other branches of industry closely allied thereunto (1875).

3) The proceedings of the convention of members of the society in 1882 in Moscow (1882).

4) The proceedings of the commission upon cleansing towns (1884).

5) The proceedings of the convention of starch manufacturers and dealers (1885).

6) The proceedings of the convention on naptha conduits and

measures nescessary for the development of the petroleum industry in Russia (1885).

7) The report of the commission on Lindley's scheme for a net-work of underground sewers in St. Petersburg (1886).

8) The proceedings of the committee for testing steel for rails and tyres (1886), first part.

9) The «Photographer» for the years 1880—1884 devoted to the cultivation of the bromo-gelatine process and instantaneous photography.

10) A collection of articles on photography for 1887—1889.

11) A collection of technical adjudications of the jury of the exhibition of illuminating appliances and the petroleum industry (1889).

12) The proceedings of the committee on a system of railways for the whole of Siberia (1889—1891).

13) The proceeding of the convention of Russian workers in the field of technical and proffesional education (1889—1890).

14) The proceedings of the committee of organization of the convention of Russian workers in the field of technical and proffesional education.

15) Electro-magnetic mechanism of Sylvanus Thompson.

16) A short account of the present state of electric engineering (1892).

17) A description of the net-work of Russian railways compiled by the VIII section of the Imperial Russian Technical Society at the request of the Russian section of the 4th session of the international congress at St. Petersburg in 1892.

18) A systematical index of the decisions of the council and at the General meetings of the Imperial Russian Technical Society during (1866—1884).

19) An index to the articles contained in the Memoirs of the Imperial Russian Technical Society for (1867—1888).

20) Catalogue of the 4th electrical exhibition with explanatory articles on electricity and its applications.

21) Lvoff, T. N. Public lectures on notable inventions and discoveries (1874).

22) Messrs. Rikatchoff, Spitzin, Philipenko and Koozminsky notes on *ballooning* for 100 years (1883).

23) Andreyeff P. P. Franco-Russo-Anglo-German technical Dictionary (1881).

24) Yablotchkoff P. I. A public lecture on electric illumination (1879).

25) Egerstrom N. I. A public lecture on the invention of powder and fire-arms (1875).

26) Butleroff A. A public lecture on illuminating gas (1875).

27) Zavalishin. Steam boilers (1887).

28) Khvolson O. About the metrical system of weights and measures and its introduction.

29) Khvolson O. Why is perpetuum-mobile impossible? (1888).

30) Kickherhardt I. A practical treatise on Merchant ship building with an atlas of plans. Translated from the Swedish edition (1875).

31) Tschijikoff I. A type of charging boxes for field artillery (1880).

32) Vischnigradsky I. The fundamental laws of the mechanical theories of heat (1873).

33) Krasnofsky M. The general principles of the theories of possibilities and their adaptation to some statistical and economical questions (1874).

34) Evnevitch I. The fundamental principles of hydrostatics (1874).

35) The first aids to be rendered at accidents in workshops (under the editorship of Dr Zdekauer).

36) A catalogue of works and publications upon technical-trade and professional education (1889—1890).

37) Bergman. Proff. The magnetic current (1892).

38) The Imperial Russian Technical Society at its foundation in 1866 consisted of 332 members of which 9 were founders, 4 honary members, 311 effective, 5 amateur and 3 corresponding members.

On the 1st of January 1893 the total number of members of the Central Section was 627 of whom 602 resided in St. Petersburg and 25 elsewhere; this number included 48 honorary members, 5 founders, 6 corresponding and 16 amateur members.

In additiou to the above the number of members of provincial Sections on the 1st of January exceeded 1000, comprised as follows:

In the	Odessa	261
» »	Kieff	208
» »	Nishigorod	112
» »	Turkestan	110
» »	Don	71
» »	Baku	56
» »	Dombrof	41
» »	Esthonian	33

and nearly as many more in the remaining Sections.

From the very foundation of the society in 1866 until the day of his death, extending over a period of 25 years, His Imperial Highness

Nicolas Maximillianovitch Romanoffsky Duke of Leuchtenberg filled the post of Honorary President of the Society.

Since 28 May 1892 with the Supreme sanction of His Imperial Majesty, H. I. H. the Grand Duke Alexander Michaelovitch has be pleased to accept the title of *Honorary President* of the Society. Among the *Honorary members* are His Imperial Highness the Heriditary Grand Duke Czarevitch Nicolas Alexandrovitch who was pleased to assent to this title Feb. 19, 1888.

His Imperial Highness the Grand Duke Michael Nicolaievitch has deigned to be the *Patron* of the Caucassian and Baku Sections since 1869.

The late Grand Duke Constantine Nicolaevitch was *Patron* of the IV, VI and IX (Committee on technical education) Sections from 1871.

The pecuniary means of the Imp. Russ. Tech. Soc. at the onset of its career in 1876 were very scanty as, with a very small exception, it consisted entirely of the members subscriptions.

Eventually they were augmented by several donations and grants. Thus, during the period between 1870 to 1873 the following donations were received for organizing the museum of applied sciences and arranging premises for accomodating the Society in the buildings of the National Exhibition of Manufactures of 1870; from its former honorary President the Grand Duke Nicolas Maximillianovitch 10,000 Rbls, various other persons 35,000 Rbls, and the State 36,000 Rbls not to mention the 36,000 Rbls which M. Kronenberg lent the the Society for 2 years, free of interest.

The capital of the Society for the year ending Dec. 31st 1892 consisted of the following sums:

	Rbls.	Cop.
1) Reserve fund	17,642	3
2) Circulating capital	1,224	61
3) Museum fund	6,214	85
4) Separate funds of the V, VI, VII, VIII and IX Sections	20,571	87
5) Exhibition special fund	2,372	85
6) For various trials	12,502	58
7) For furthering the introduction of the metric system of weights and measures	6,252	56
8) For awarding premiums	2,700	—
9) For founding the A. Nobel medal	6,418	75
10) General National fire donation fund	1,623	—
11) Scholarship grants to technical students	687	50
Total	78,210	60

The Society receives the following grants for the Central Section:	
From the Government, for increasing the Means of the Permanent Committee upon Technical Education	29,916 Rbls.
From the Government for the Museum	6,000
From the Government for the publication of the Memoirs of the Society	3,000
From the Board Committee of Russian Railways for publication of «Railway Affairs»	6,500
Total . . .	45,416 Rbls.

In 1892 the balance sheet of the Central Section alone, reckoning the income and expenditure, reached nearly 170,000 Rbls.

The provincial branches, although they also receive partial assistance by local subsidies, are principally maintained by the members subscriptions. The yearly balance of some have already exceeded 15,000 Rbls.

As characteristic of the labours of the various branches of the Imperial Russian Technical Society is appended.

An Historical Sketch of the proceedings of the Kiev Section, 1871—1892.

The Kiev Section of the Imperial Russian Technical Society was founded December 25th, 1870, originally its special aim was the developement of the beet-root sugar manufacture and allied branches of industry in Kiev and the adjacent provinces.

Thanks to the interest taken in the movement by the Director of the administration of the Goroditchensky refinery V. T. Simarenko, the premises of the Section were located in Goroditch (Kiev Gov.) but owing to the continual increase in the number of members, which had reached 179 persons, residing in various parts of the south-western district and even beyond its confines, it was found necessary in the latter part of 1873, to remove the offices to a more central point, to Kiev, where they are situated at present.

With the transfer of the offices of the Section to Kiev the number of members commenced to increase, and in addition to beet-sugar

manufacturers, specialists in others technical branches joined the section, especially after the offices of the South-western railway were transferred to Kiev, and the interest taken in the affairs of the section by A. P. Borodin the present director of the South western railroad. In view of all this, in 1887, the necessity of enlarging the original instructions and converting the section into a general-technical one with three sub-sections: beet-sugar manufactory, mechanical building and a photographic one, became clearly apparent.

This want was fulfilled by the granting of new instructions to the Section February 17th, 1888.

The results of the labours of the Section are contained in 22 volumes of «Memoirs» issued under the editorship of T. I. Lopotschevsky (1870—1889) and ultimately under L. Lund.

These «Memoirs» contain the minutes of the Council sittings and General meetings of members of the section, as well as the technical meetings of the sub-sections and a whole series of original articles relating, chiefly, to the manufacture of beet root sugar and other questions closely connected there with.

Among the questions, not directly concerning the beet sugar industries, that of the local mineral fuel (bog coal etc.) was, with great earnestness and zeal taken up and discussed by the Section, with a view of bringing it into use and thus lessening the cost of fuel, as well as the undesirable destruction of forests. From 1873 the «Memoirs» have contained, A summary of literature concerning the technical side of beet sugar manufacture, which furnishes a complete account of the foreign periodical and book literature on the sugar industry, enabling Russian fabric owners and masters to follow up what European science is doing for that industry. Thus, the «Memoirs» besides given accounts of the proceeding of the Section is, at the same time, the special organ of the beet sugar industry, the only one in Russia.

Some of the articles contained in the «Memoirs» forming complete subjects in themselves, were issued in pamphlet form by the Section, viz:

Biroukoff, A. The preservation of beet root. Kiev, 1872 (8° pp. 60).

» » The diffusion method of extracting the juice from beet root. Kiev, 1876 (8vo pp. 31).

Bunge, N. A. The beet sugar industry at the Paris Exhibition 1878. Kiev, 1879 (8vo pp. 94).

Ditto. The South western district at the Universal Art and Industrial Exhibition in 1882 in Moscow. Kiev, 1883.

Ditto. The beet sugar industry at the Paris Exhibition 1889. Kiev, 1890, (8vo pp. 44).

Weidemüller. Auxillary Tables for sugar bakers. Kiev, 1873, (4to, pp. 84).

Vivienne, A. A practical course on the manufacture of sugar in France. Kiev, 1875 (8vo).

In addition, the Section published:

A Chart of beet sugar manufactories.

Tschoubinsky P. Beet sugar manufactories of the Russian Empire with official statistics concerning them in $187^1/_2$—$187^4/_5$.

And a premium of 500 Rbls was given to L. Piatokoff for his «Handbook to the chemical analysis of products and materials used in the production of beet sugar».

Since 1881, thanks to the courteous assistance of the Revenue Department, the Section publishes a «Year book of the beet sugar industry in the Russian Empire» compiled by M. Tolpighin for $188^1/_2$—$189^1/_2$ containing an alphabetical list of sugar refineries and where situated, also the chief employees; the amount of sand and lump sugar refined in each refinery in Russia, a list of apparatus used in each refinery; notes on foreign sugar trade, laws and regulations affecting the beet-sugar industry, balance sheets of sugar bakery and refining companies etc. In 1892 the «Year-book» was awarded the premium of the Heriditary Grand Duke, founded in the Imperial Russian Technical Society.

The Section has not confined its labours exclusively to the discussion of questions and the publication of works relating to the beet sugar industry but it has also directed its attention to the founding of institutions useful to the district. In the first days of its existance the Section was instrumental in founding a lower grade technical school for the beet sugar industry, in Smiela (Governm. of Kieff). Its endeavours were crowned with success thanks to the enlightened assistance of Count Bobrinsky a honorary member in whose name it was instituted in 1884, the first, and only, school devoted to the beet sugar manufacture in Russia, and called. «Technical classes in beet sugar manufacture» During 8 years 83 pupils have entered the classes, of whom 63 finished the full course, 13 are continuing their studies and 8 left the school. All who finished the full course are employed in refineries i. e. are earning their living by making use of the knowledge they gained at the school. Mr N. V. Cherikofsky the director of the Smiela sugar refinery is patron of the school.

In order to enable masters and companies to have their raw materials and worked up products analysed, the Section has since 1875

retained the services of an efficient chemist, who is bound to make such trials.

During 17 years the chemist has made 1416 analysises most of which were of an elaborate character requiring great care or were of a decisive nature in contentious questions. From 1875 till 1891 the chemist to the Section was Mr B. Raikevicz, Bachelor of natural sciences at the St. Vladimir University, since them Mr L. Lund Bachelor of natural sciences has filled the post.

Desirous of enabling schools and manufactories to obtain apparatus and chemicals at the lowest possible prices which at that time was very difficult in Kiev, a depôt of chemicals and chemical apparatus was opened at the offices of the section in 1879 which was eventually, in 1883, given over to the firm of «Olshevicz and Kern» who are appointed commisioners to the section.

In accordance with the proposal of the General-governor of the Kiev Podole and Volinsk governments an auxilary committee was formed at the Section, in connection with the organisation of the national exhibition in Moscow in 1882 for assisting intending exhibitors in obtaining all necessary information and for aiding in sending a representative collection of the industrial branches to the exhibition. Besides fulfilling this work the Committee published, under the editorship of N. Bunge and out of the means furnished by the General-governor and the contributions of the committee of the Kiev Exchange and others: The Proceedings of the Kiev auxillary committee of organization of the national exhibition of art and industry in Moscow 1882 (Kiev 1882 4to pp. 409) which embraced a review of the labours of the Committee, a list of the manufactories of the South-wertern district with their annual output; detailed notices of some of the works and manufactories who exhibited at the exhibition, together with a full account of the technical schools of the South-western district.

In addition to the above, by means of exchange and purchase, the Section has acquired a very useful library on the beet sugar industry and took part in the agricultural exhibition at Kiev in 1871, the Vienna exhibition 1873, Philadelphia exhibition 1876, Paris exhibition 1878 and finally at the national exhibition of art and industry at Moscow 1882; at the first four of which it exhibited its publications and articles relating to the beet sugar industry and at the latter in addition to its publications, it exhibited at Moscow a collection of minerals and specimens of rock-stones which were accompanied by an exhaustive catalogue. The Section has been awarded the highest prizes wherever it has exhibited.

The presidential chair of the Section during 1871—72 was filled by Proff. P. Aleksaiff, St. Vladimir University and since 1873 by Proff. N. Bunge of the same University.

From the foundation untill 1876 P. Tschoubinsky was secretary of the Section and from that time up to the present F. Donatt has held that post.

WORLD'S COLUMBIAN EXPOSITION 1893.

CHICAGO.

Notice upon the labours of the *Permanent Commission upon Technical Instruction* (IX-th Section of the Russian Imperial Technical Society at St. Petersburg.)

by

V. Sabanin.

The «*Permanent Commission upon Technical Instruction*» constitutes the IX section of the Russian Imperial Technical Society *), founded in 1866. Organised in 1868, thanks to the success of a memoir upon the instruction of apprentices and foremen presented to the Technical Society in 1868 by Privy Counciller Professor Eug. Andreev, the Commission now numbers about 180 members **).

I. Organisation.

The members of Commission meet in plenary sittings (general meeting) two or three times a year, in order to examine the report on the labours of the Commission for the past year and the programme of work for the following year. Besides this these general meetings are called for the election of the members of the Committee (непремѣнные члены), the secretary. the vice-presidents and the president of the Commission, as also to examine important questions submitted to these meetings by the Committee. The transaction of current business, the man-

*) The sections are as follows: I. Chemico-technical Section, II. Section of mechanics and machine construction, III. Section of civil engineers, IV. Military and naval section, V. Photographic section, VI. Electro-technical section, VII. Aeronautic section, VIII. Railways' section, IX. Permanent Commission etc.

**) Nov. 1892.

agement of the schools founded by the Technical Society and placed under the supervision of the Commission, as well as the examination of scientific questions, fall to the task of the Committee of the Commission, composed of 10 to 18 members, elected by the general meeting for one year und meeting two or three times a month. This Committee has further the right of electing Commissions ad hoc for the elaboration of special questions. Finally the daily management of the schools as well as the current correspondence and the settlement of matters and questions of urgency is entrusted to the board, composed of the president, the 3 vice-presidents, the secretary and the general inspector of the schools.

II. Means.

Having begun its work in 1869 with the modest sum of 500 Rbls. the Commission now works with a budget of about 80,000 Rbls, thanks to the interest which the government takes in this institution and to the active assistance of the owners of works and manufactories in St. Petersburgh, among whom a generous part is taken by the director of the Russo-American India-rubber Manufactory, M-r G. Heise. Neither can we pass over in silence Professors Leshaft, Beketov, Petri and others, who gave a series of lectures for the benefit of the schools of the Commission, which attracted large audiences, thanks to the popularity of the lecturers.

III. Elementary schools and Courses for the working classes.

The course of studies in the schools organised by the Commission for the children of workmen is divided into three years, or three sections. Children entirely without instruction are admitted to the first class. The instruction is entrusted to a lady teacher, who is employed four to five hours every day except Sunday. The pupils of all the classes are present at all the lessons. The subjects of instruction are: religion, Russian language, arithmetic, drawing; the reading lessons and object lessons serve to give the pupils elementary notions of natural history, Russian history and geography. The extent of the programme is in

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*) The general meeting elects a member of the Committee for each 10 members of the Commission.

**) Budget for 1893, 81,471 R. 24 K.

conformity with that of the State schools with one class and three years course. In addition, the girls are taught to sew, to knit and to do various other hand-work.

In the classes or courses for adult workmen and workwomen instruction only takes place from 8 to 10 or from 7 to 9 o'clock in the evening during week-days, and on sunday mornings. These classes fall into general and special sections (which will be discussed in Chap. IV), each with a complete Course of 2 years. The age of admission is from 12 years. The pupils are admitted to the first general class even without any preliminary knowledge; the fee is 30 Cop. a month. From its beginning the Commission recognised that general instruction acquired in childhood should serve as the foundation for all technical instruction, and that the evening and sunday classes or courses for adult workmen should be called upon to make good the deficiencies in primary instruction while contributing at the same time to the moral and intellectual development of the workman.

This is why the Commission passing to the practical execution of its projects, began by occupying itself with general elementary schools, considering it necessary to prepare the working classes for the study of applied science by trying to elevate its moral and intellectual level. Its efforts in this direction did not remain without effect, and the Commission was able to flatter itself that it had given during the years 1869—92 primary instruction to about 13,300 workmen, workwomen and children of the working classes.

The Commission manages *):

12	primary schools for children of workmen with	1183 pupils (both sexes).
3	» » » workmen under age . .	143 »
3	» » » workwomen under age .	120 »
11	evening schools for adult workmen **) . .	667 »
1	evening school for adult workwomen . . .	50 »
1	workshop-school for women's work . . .	25 »
	Total 31 schools with . . .	2198 pupils.

This result ought not to appear insignificant, taking into consideration the great difficulties which the Commission had to overcome, especially at the beginning of its labours.

The work undertaken by the Commission had scarcely any precedent, and it was only with great reinforcements of energy that the

*) Report for 1891—92.

**) Of which 10 at St. Petersburgh and 1 at Reval.

Commission, guided by the intelligence and indefatigable zeal of Mr Andreev, succeeded in realising its projects.

On studying attentively the needs of the workmen and the means of satisfying them, the Commission was soon obliged to report that there was no lack of persons desirous of enlarging their field of intellect, but that it had not at its disposition the teaching force necessary for the instruction of the workmen, instruction which ought to have a quite different character from that which is given in the ordinary schools. The Commission had to teach the instructors to know the working class, to give them the practice and experience necessary for teaching adults; the workmen placed on the school forms could not be treated as children. Their knowledge was less than that of the latter, study presented serious difficulties to them, and the difficulty of the teachers task was aggravated by the requirements of the workmen whose age and practical reasoning strove to control the teachers. Thanks to the good will of the persons interested in this question and above all to the energy of the instructors themselves, the Commission now possesses a serious and intelligent staff, equal to meet the wants of that working class, so desirous to know and so impatient to attain its object, although almost deprived of school capacity. Besides the difficulties, met with in the task of training a sufficient number of clever and expert teachers, the Commission had to struggle forcibly against the tendency of the workmen to leave the schools before the term of their studies.

Beyond accidental causes, as unskilled teachers, and extra night work (especially during the last war with Turkey), the Commission encountered permanent difficulties, hindering the tendency of the workmen towards instruction and lessening the real number of persons desirous of visiting the schools. The Commission studied these causes, and the following are the results of its enquiries in this direction. The causes which prevent the workmen from attending the evening and Sunday courses may be classed under two categories. The first include those which result from the position of the workmen himself, the second emanates from the school and its special character. The causes classified under the first category are: 1) the tiring nature of factory work *); 2) the difficulty presented to the adult by primary instruction, especially considering the impossibility for the workman to be scrupulously punctual in attending the courses;

*) The workmen come to school after having worked about 10 to 12 hours, thus having to steal their time for study from their hours of rest.

3) the absence in Russia of a law regulating the hours of labour of workmen, minors as well as adults, preventing the former from acquiring elementary education at an age when it is acquired with relatively less effort, and fixing a reasonable maximum of working hours for the latter. The causes classed under the second category are: 1) the distance of the courses from some manufactories or workmen's homes, in consequence of the limited number of schools; 2) the restricted number of teachers familiar with the special task of teaching workmen; 3) the private character of these schools, whose pupils on completing their studies are entitled to no privilege in respect of the reduction of the term of military service; 4) the absence of text-books adapted to the wants of workmen; 5) the absence of libraries for the workmen. The Commission is working principally at the removal or lessening of these difficulties.

Thus it was the Commission elaborated the project for regulating the labour of adult workmen and of those under age, which was sanctioned as law by His Majesty the Emperor the 1st of June, 1882.

The instruction of the working class in Russia owes a great obligation to this act of legislature, as by virtue of art. 5 of this enactment, the owners of works and manufactories are required to give to such of their workmen being minors as have not completed their studies in the elementary rural schools with one class (lasting three years) the opportunity of attending school at least 3 hours a day, or 18 hours a week. Likewise in virtue of art. 9 of the supplementary act of the 12th of June, 1884, workmen who being minors possess the above mentioned knowledge, must be granted the opportunity of continuing their studies where the factory possesses a school of a grade higher than those which have been mentioned, or even if there is such a school in the neighbourhood. If the factory itself is not in a position to organise a school for its workmen under age, the special inspectorate entrusted with the supervision of the execution of the law in question shall enter into relations with the local educational authorities, in order to adapt one of the neighbouring schools to the wants of the workmen or to organise a new school at the cost of the Government.

It was not without result that the Commission laboured to destroy also the other obstacles placed in the way of the progress of the workmen's education.

Thus, the schools organised by the Commission were, in 1881 placed under the authority of the Minister of Public Instruction. By decree of the

*) According to the law of 1882 children of the age of 12 to 15 years are allowed to work 8 hours.

State Council, sanctioned by His Majesty the Emperor on the 25th of May, 1882, a special regulation recommended by the Russian Imperial Technical Society was confirmed. This decree recognised the same rights as belonging to those schools as are possessed by the elementary State institutions, conferring certain privileges upon the pupils by reducing the term of obligatory military service.

As to the question of text-books, the Commission already possesses some courses elaborated by several of its teachers, whose practical value has been proved in the Society's schools.

School libraries are already organised in almost all the schools of the Commission and are beginning to be used by the working class. The loan of books to be taken home is allowed upon leaving a moderate deposit.

IV. Special classes in the elementary schools.

In fixing the general bases of its action, the Commission recognised that the elementary classes or evening lectures might give a certain technical instruction in order to create fairly enlightened and intelligent workmen, foremen, mechanics, draughtsmen and other artisans. According to the views of the Commission, instruction in the technical sciences in the primary schools should be of an elementary and popular character. The number of the sciences as well as the extent of their programmes should be restricted so that the pupil may be able to acquire in the little time at his disposal a substantial knowledge without too great difficulties. The Commission therefore organised, at the very beginning of its labours, besides the two general classes of the evening courses for workmen, where there was a sufficient number of persons desirous of obtaining special knowledge, two supplementary classes where religion, the Russian language, arithmetic, linear drawing, singing, the rudiments of history and geography, geometry, physics, mechanics and the elements of chemistry were taught.

The Commission having recognised the enormous importance of the study of drawing for workmen and artisans, and wishing to furnish a greater number of workmen with the opportunity of improving themselves in this subject, instituted in addition the above mentioned classes special classes of linear drawing, at present two in number. The object of these classes is to teach linear drawing to workmen and the draughtsmen in manufactories, so as to put them in a position not only to understand a plan, to enlarge or reduce it, but also in cases of need to be able to draw a similar plan themselves.

Technical drawing is also taught in the evening courses for workmen, according to a special method elaborated by the Professor of linear drawing of the Technical Society's schools, Mr Sakhanov, and by the Inspector of one of these schools, Mr Korolkov. This method is distinguished by the fact that it teaches the pupils from the beginning to draw simple objects from nature, and provides them by means of special figures some geometrical notions, with a view to familiarising them with the principal geometrical terms. This is particularly useful in schools where the pupils are factory workmen, for by this method the pupils are taught upon models of machines employed partly in these factories.

The course of studies in the special classes of linear drawing, attended for the most part by workmen possessing little instruction, adults as well as minors, is 6 hours per week 3 years, for 8 months in the year. In this period of time, the pupils succeed in making complete drawings of donkey-engines, pumps and steam-engines, lathes and other complicated benches, and in colouring the drawings. After finishing this course the pupils of the said class are capable of entering the drawing offices in factories, which is very important for them, as a workman knowing how to draw, receives double the salary of the other workmen.

V. Special technical schools.

Proceeding to the realisation of their labours in reference to the organisation of special technical schools, the Commission with the generous assistance of the Government and of some private persons, founded three institutions: 1) the school of building foremen (draughtsmen), 2) trade school for smiths and fitters, 3) the school of printing.

The school of building foremen was founded in 1874, with the help of the Society of Architects of St. Petersburgh. This school has for its object to give workmen employed on buildings and engineering works general instruction within the limits of the rural schools with two classes (last five years), as well as all the special subjects necessary to become foreman of works of building and engineering. This school differs from the general type of the other schools in this: that it only admits workmen who can read and write, have practical knowledge of building, and are not less than sixteen years of age. The course lasts two years, the studies are from seven to eight hours a day six months in the year. During the free hours the pupils prepare their lessons, repeat, draw and make models, being occupied accordingly

all day at the school. The poor pupils receive during the teaching months in the forms of loans small scholarships which they have to ieturn to the school in order to receive their diploma, or they may settle their debts by working in the establishments whose scholars they have been. At this school: religion, the Russian language, arithmetic geometry, history and geography are taught, to the same extent as in the special evening classes for adult workmen.

Further subjects of instruction are the science of building (materials and works), fuel, an abridged course upon the resistance of materials and of parts of buildings, the making of an estimate, the building and repair of railways, levelling and surveying, as well as linear drawing and ornament. The modelling is done with wood and plaster. Further, the pupils of the first and second classes are required to occupy themselves with practical work, during the summer months (from the 1st of May to the 1st of November) during the holidays and to present a certificate from the person with whom they have worked at the beginning of the teaching year to the inspector of the school. The Commission is now trying to organise during the summer holidays practical occupations having reference to the different categories of work under the supervision of competent persons.

During the 18 years of existence counted by the school of foremen builders, it had 412 pupils of whom 211, having completed the course, obtained diplomas and at present occupy positions as foremen in the building of houses, bridges, railways and works of fortification. The capacity of the pupils of the school is well known and appreciated by builders, so that pupils in the second class receive invitations for employment as foremen even before passing their last examinations. And this is why the school is often not in a position to meet all the demands made upon it to recommend foremen.

The former pupils of the school who apply to the Commission for situations, often present excellent certificates which have been given them by the persons with whom they have been working. A certain number of pupils took part in the work of the rear guard of the army during the Oriental war in 1877 in the capacity of foremen for the construction of barracks and other buildings of this kind, and received not only the most flattering notices from their principals, but were also decorated with medals. Moreover the works of the pupils of the school such as various drawings and models of buildings received honourable mentions at the 1876 Exhibition at Brussels, at that of 1877 at St. Petersburgh, of 1882 at Moscow, at the Artisans Exhibition at St. Petersburgh in 1885.

In 1879 was founded the second special school of the Society: the trade-school for smiths and filters, having for its object the completion of the general knowledge of the pupils and the giving of them exact elementary notions of technical processes and of the scientific laws of various trades connected with wood and metal. In this school boys of all classes are received after being submitted to an examination in accordance with the course of studies of the Society's schools for minors. The course of studies for apprenticeship is of three years' duration and is divided into three classes: a preparatory, and next the 1-st and 2-nd. The studies are divided into occupations in class or theoretical and practical or manual works in the workshops of the school. Both are obligatory for all the pupils and occur every day except holidays. In the first and second classes three hours are devoted to theoretical occupations and five hours to practical. In the preparatory class there are five of theory and three of practice.

During the summer the theoretical lessons are discontinued, but the pupils of the first and second classes work daily in the workshops of the school (not more than eight hours a day). One day a week the pupils visit various factories and workshops, or make scientific excursions under the supervision of an inspector or of one of the masters. Further with the object of assimilating as much as possible the workshops of the school with the conditions prevailing in the factories, the pupils who desire it, with the consent of the school management, are at liberty to work in the local factories during the summer.

The subjects taught at the school are: religion, the Russian language, history, geography, arithmetic, geometry, physics, mechanics, technology of metals and wood and linear drawing to the same extent as in the special classes of the Society's schools. The practical learning of trades, viz. carpentry, locksmith's work, turnery, the forge, copper and iron founding, and nickeling, is carried on in the workshops for apprenticeship belonging to the school.

In establishing the school the Commission directed its whole attention to the organisation at once of the regular and practical teaching of trades. It recognised that practical manual work was indispensable, and that it should be productive and executed with great preciscion. Work in the workshops begins with the preparatory class, where the pupils are occupied alternately with all the above mentioned trades. Specialisation is only permitted in the first class. The pupil learns a trade by working at articles that may be made use of and from the beginning he is accustomed to take account of the execution of the work and the economy of time and materials. Recognising that the

school cannot prepare thoroughly efficient workmen, and wishing to diminish as far as possible the duration of the ordinary apprenticeship of the pupils, the Commission has assumed the task of giving them during the three years of study at the school, a theoretical and practical preparation calculated to render them capable of becoming rapidly familiar with the work of private workshops and factories, to complete successfully with unskilled workmen and to become shortly after their leaving school competent workmen and builders. The short duration of the course and the moderate school fee, 20 roubles a year, many pupils being even admitted free, attract to the school poor children and especially the sons of artisans and workmen in the factories, who spread afterwards among the workmen of the workshops necessary theoretical knowledge and the habit of conscientious work. Replacing routine by a scientific basis, the pupils contribute thereby to the perfecting of the trade.

The sympathy shown them by several of our manufacturers in affording them moral and material support, the flattering character which they give the former pupils working in their factories, the high reward (a diploma of honour corresponding to the gold medal) adjudged to the school at the exhibition of Russian arts and industries at Moscow in 1882, as well as the information obtained upon the progress made by a considerable number of its former pupils, prove beyond dispute the utility of this institution and justify the hope in its future prosperity. During the years 1879—92, 171 pupils finished the complete course of the school.

The *school of printing* founded in 1884 thanks to the energy of Mr Poutiata and to the support of a few master printers, is intended for boys already working in printing-offices. The course lasts two years for nine and a half months in the year and fourteen hours work in the week. The subjects of instruction in this school are: religion, the Russian language, arithmetic, history and geography, according to the programmes of the special evening classes for adult workmen, and as professional subjects, the technical part of typography, foreign alphabets, and linear drawing and ornament. The technical side of typography is studied at the school at first as a whole. the pupils being acquainted with the materials, machines and instruments, and afterwards in particular the processes of type composing and printing in theory and practice.

The foreign alphabets taught are the Greek, Latin, French, German and English; further attention is paid not only to mechanical

reading, but also to the use of capitals, to punctuation and the division of words.

Bearing in mind that beyond the mere knowledge of orthography and the technical side of printing, it is important to develope in the pupils æsthetic feeling, the Commission devoted special attention to the introduction of special instruction in drawing according to programmes drawn up for the school.

VI. Female professional elementary schools.

The Commission, having recognised that schools, where women and girls might in a relatively short time learn manual work, would offer a serious means for the improvement of the position of poor families and at the same time turn out women capable of putting their work to account not only in their own homes, but also in industrial establishments, occupied itself seriously with this question.

After having discussed it at two lectures on the subject by Mr Iversen and Mrs Chernov, the permanent Commission for technical instruction submitted this question to a prolonged consideration by a special Commission, in which not only the members of the permanent Commission took part, but also a number of distinguished teachers and several ladies interested in improving the position of poor women. The result of these labours was a general scheme for the *regulation of female professional schools*, which served as the foundation for the establishment of similar schools by several private persons, of whom the first was Mrs Korobov, who founded her school in 1879. Several of these female professional schools at St. Petersburgh are under the patronage of the Technical Society, and under the supervision of the Permanent Commission, such as those of Mrs Korobov, Mrs Messing and others.

The Commission has not yet been able to organise a school of this kind itself on the one hand on account of the lack of pecuniary resources and on the other of its immediate object being the consolidation and development of special technical schools, founded by the Society. At any rate the labours of the Commission in this direction resulted as has been seen in private enterprises, thanks to which a type of female professional school in Russia is now beginning to be formed, the practical value of which is making itself felt.

VII. Lectures.

While devoting the majority of its meetings to questions touching the organisation and improvement of the instruction in the schools, the Commission has been working since the beginning at the theoretical and scientific study of the questions arising out of technical instruction as a whole. Thus the Commission devoted its serious attention to the theoretical and practical study of the question of workmen's education and of professional instruction. Almost at the commencement of the labours of the Technical Society, Mr E. Andreev, one of the founders of the Society, presented in 1868 a report, already mentioned above, upon «the instruction of foremen in Germany, Switzerland, Belgium, France and England». This report, as we have seen, resulted in the creation of the *Permanent Commission on technical instruction*. Assured by this fact of the utility of reports and lectures followed by discussions between the audience and the lecturer, the Commission took care to provide that its members should not be without debates of this kind. We have already seen the results attained by the reports by Messrs Janson and Nebolsin upon the labour of minors, and by the lectures of Mr Iversen and Mrs Chernov upon female professional schools. Let us here mention the other lectures upon questions of education in general and in particular upon technical instruction, which took place in the Commission during the years 1869—92.

After elaborating almost at the commencement of its labours a *plan of the instruction to be pursued in primary technical schools*, the Commission never ceased working at the improvement and development of technical and elementary education. This was why Mr E. Andreev resolved to deliver a series of lectures upon the *school question in Russia*, in order to present his ideas upon this subject in a systematic form. The long career of the lecturer as an educationalist and his wide knowledge of educational institutions in Russia and abroad being well known, these lectures presented a great interest and were followed with the greatest attention not only by the members of the Society, but also by many other persons employed in questions of education. These lectures seven in number treated the following subjects.

1°. The organisation of technical instruction, its social role and economic value.

2°. Preparatory instruction for candidates for the technical schools, the character of the instruction in these latter (general and technical subjects of instruction).

3° to 5°. The primary and national school, practical instruction, the preparatory and high school (progymnasia and gymnasia).

6°, 7°. The other middle schools besides the high schools. high-schools in general, the agricultural and technological institutes.

8°. Professional middle schools, instruction in prisons, monasteries and nunneries, female education.

9°. Elementary professional and agricultural schools, evening and Sunday courses. The teachers, the teaching of the arts, conclusion.

This series of lectures started a number of questions among the members of the Commission and had as its immediate result the drawing up of a *programme of instruction for superior technical schools*. Besides the series of lectures by Mr Andreev, we ought to notice here those of Mr Debolsky, upon the improvements to be effected in Russian schools, of Mr Gerasimov upon a reform of instruction in the universities and academies, of Mr Simashko upon the organisation of professional schools, of Mr Ilyin upon the organisation of school exhibitions, and of Mr Nebolsin upon the labours of Mr Andreev on the development of technical instruction in Russia.

In order to enable its members to become better acquainted with the technical educational institutions in Russia and abroad and to receive ideas upon the subject direct from eye-witnesses, the Commission delegated several persons to visit these establishments and to report upon them to the members of the Commission. Among the reports of persons so delegated in Russia let us mention that of Mr Sokolovsky upon the schools of Novorossisk and upon the school of railway-guards of the Ministry of Ways of Communication, that of Mr Demchinsky upon the railway schools, of Mr Ilyin upon the factory schools at Narva, the female industrial school of the Patriotic Society, and the Sunday drawing school of the Academy of Arts, and upon the industrial schools in Russia according the data of the art exhibition at Moscow in 1882, of Mr Abramov upon the industrial school at Ishev, of Mr Troitsky upon the industrial schools in the governments of Kazan and Nishni-Novgorod, and finally of Mr Levitsky upon industrial instruction in the governments of Voronezh and Riazan, and finally of Mr Garshin upon technical instruction in the coal basin of the Don.

In the same category we must draw attention to the lecture delivered by Mr Putiata, one of the most eminent members of the Commission, having been President from 1883 to 1886, upon the teaching of geometry in the schools of the Technical Society, that of Prof. Leshaft upon the teaching of natural science in the special schools, that of Mr Sreznevsky. Ph.D. upon the scientific bases of photography, of Mr Ilyin upon

a simplified collection of physical instruments for the teaching of mechanics and of Mr Orloff upon the teaching of drawing as applied to weaving.

The lectures delivered by Messrs Putiata, Leshaft and Sreznevsky resulted in the creation of special Commissions for the revision of the programmes for arithmetic, geometry and natural science in the Technical Society's schools, and for the drawing up of a programme for a school of photography. The reports already mentioned upon industrial schools in Russia largely contributed to the success of the labours of the Commission, and above all to the framing of a *review of technical educational institutions in Russia.* Among the reports presented by persons sent as delegates abroad must be mentioned those of Messrs Vedrov and Lachinov upon professional schools in France, that of Mr Debolsky upon technical educational institutions in Germany and Austria, that of Mr Miasoyedoff upon professional schools in France and Belgium, those of Messrs Nebolsin and Tonne upon education and technical schools in Germany, that of Mr Asbelev upon æstetic societies and industrial societies and museums in Germany, of Mr Tits upon the measures adopted for the education of artisans at Berlin, of Mr Ilyin upon the schools for adult workmen at Wurtemberg, and upon the educational section at the universal exhibition of Vienna in 1873, of Mr Asbelev upon the evening courses for workmen in England, of Mr Sreznevsky upon the teaching of photography and photo-mechanical processes in special schools abroad, of Mr Chaplin upon the application of anthropometry in the french schools and finally the reports of the delegates of the Commission at 1) the international Congress for technical, commercial and industrial instruction at Bordeaux in 1886 (Mr Miasoyedov), 2) the international Congress for technical, commercial and industrial instruction at Paris in 1889 (Mr Reincke).

The Commission having already worked many years at the question of the teaching of trades, several persons have presented reports upon the same. We will here mention the lecture delivered by Mr Abramov upon the method of teaching trades, in our elementary schools, of Mr Rosenberg upon the means of developing technical knowledge in the midst of the rural class employed in domestic industries, of Mr Ilyin upon the necessity of admitting the teaching of trades into the programme of our elementary schools and upon the supplementary classes for teaching trades in the parish schools of Russia, and finally that of Mr Voronetsky upon the teaching of trades in Scandinavia.

As in the question of the instruction of workmen, the Commission met with a lack of teachers in the question of teaching trades in ele-

mentary schools. In order then to assure the possibility of instructing in a short time in the trades a number of practical teachers, the Commission in 1880 organised a course of trades for teachers in elementary schools.

The results of this attempt were fairly satisfactory and the Commission was able to convince itself that the organisation of regular courses of a similar nature would in a short time produce teachers expert in imparting the knowledge of trades in elementary schools. Let us here remark that in answer to the petition of the teachers in the primary schools for girls similar schools were organised for women, viz.: a course of book-binding, a course of basket-making and a course of book-keeping. The question of the teaching of manual work attracted the serious attention of the Commission. Besides several lectures upon this subject: by Messrs Reincke and Kovalevsky upon the teaching of manual work in France, Belgium and Sweden, and by Messrs Kazatkin, Zirul and Kotikov upon the courses of manual work for teachers in elementary schools at Theodosia, Riga and Ladoga, the permanent Commission created a special Commission for the investigation of this question. As a result of its labours we will mention among others a plan for the organisation of courses of manual work for teachers in elementary and normal schools, to take place six weeks in the summer in various parts of the Empire.

Before closing this chapter we cannot pass over in silence Mr Asbelev's and Doepp's lectures upon the necessity of special laws which should indicate the necessary knowledge and skill for workmen attending boilers and steam-engines. It was in consequence of the interest presented by this lecture that the Commission undertook the drawing up of a plan for schools for engine drivers and stokers employed in factories and works.

VIII. Relations existing between the Commission and the provinces.

The labours of the Commission did not fail to obtain a certain notoriety in the provinces. Emboldened by the Society's success, the municipal authorities of several towns, the Zemstvos*) and private persons applied to the Commission (as they have continued to do since) with the request that it would give them instructions for the organisation of professional schools adapted to local needs.

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*) Elective authorities entrusted with the management of local affairs.

We will here mention the petitions of the municipalities of Odessa and Irbit, the zemstvos of Ardatov, Mamadish, Pavlovsk, Poltava, of the director of the arms factory at Tula, of the director of the arsenal at Briansk.

Every petition of this kind is examined in the Commission, after which its office or a special commission is charged with the preparation of a report containing detailed instructions.

The Commission is further often charged with the drawing up of a complete plan for such and such a projected institution. Thus it elaborated a plan of studies for the railway school called after Derviz at Moscow, a task which presented no difficulties, as the Commission had long studied and finally determined upon *a general plan* for railway schools. In response to Colonel Kovako's petition, (celebrated in Russia for his work in connexion with electroplating), the Commission elaborated a scheme for the organisation of electrotechnical schools. It worked at the scheme for a special school of chemistry at St. Petersburgh and at one for the transformation of Mr Stokolsky's modern Lyceum at St. Petersburgh into a polytechnic school. It elaborated schemes for the statutes for a polytechnic school at Kharkov and for technical schools at Cherepovets (founded by the brothers Miliutin) and at Smiela in the government of Kiev, for professional schools at Niezhin, in the village of Markasy in the government of Simbirsk, and in the village of Pavlovo in that of Nizhni Novgorod.

Finally the Commission furnished the necessary instructions for the organisation of 1) the industrial classes in the Institute of Orphans at Gatchino, 2) an apprenticeship section annexed to the elementary school at Ochersk in the government of Perm, and 3) school instruction and workshops in prisons.

IX. Present labours of the Commission.

The present labours of the Commission may be classified in the three categories:

1°. *The organisation both educational and administrative of the schools of the Technical Society.*

Among the labours belonging to this category must be noted the following questions, which find a place in the programme of the Commission for 1893:

a) The improvement of the material position of the teachers in the Society's schools; the institution of an annual salary instead of the payment by lessons.

b) The elaboration of normal budgets for the evening schools.

c) The introduction of manual work into the schools.

d) The revision of certain programmes of instruction.

e) The organisation of educational excursions and instructive lectures.

f) The elaborations of a systematic course of needle-work for the pupils in the schools of the Technical Society.

g) The organisation of a plan of supervision to be applied to the female professional schools placed under the patronage of the Technical Society.

2°. *The study of general questions concerning professional and technical instruction.*

a) The participation of the Commisslon in the II Congress for technical and industrial instruction.

b) The organisation of apprenticeship among artizans.

c) The organisation of special classes for artizans.

d) The organisation of lectures upon special questions for adult workmen.

3°. *The foundation of new schools.*

a) The organisation of courses for engine drivers and stokers.

b) The organisation of chemico-technical and electro-technical schools.

X. The first Russian national Congress for technical and industrial instruction.

Before closing this account it seems appropriate to say a few words here upon one of the leading events in the later years of the existence of the Commission. We refer to the Congress named in the heading of this chapter, organised by the Russian Imperial Technical Society in 1889. The idea of organising this Congress arose in 1887.

Its object was to bring together from the different parts of Russia persons engaged in technical and professional instruction, to afford these persons the possibility of discussing in common the questions of principles involved in the organisation of this instruction and to attain a conspectus as perfect as possible of the methods of instruction and of the character of the various educational, technical and professional establishments in Russia.

The Congress sat at St. Petersburgh from the 25th of December 1889 till the 6th of January 1890. It was attended by 1076 members

among whom 102 appeared as delegates from societies, municipalities and zemstvos. The following is the list of the sections of the Congress.

I. General educational questions, school hygiene, modern («real») and commercial education, technical drawing. II. Middle and elementary technical and professional schools III. Agricultural instruction, schools of mines. IV. Female professional instruction. V. Manual work in schools.

This list as well as the number of members are eloquent evidence on the one hand of the interest excited by the Congress and on the other of the extensiveness of its programme. The exchange of ideas among the members had for its immediate effect the ascertainment of the needs of our special schools, the revision of our educational methods and the unanimous expression of the necessity and utility of mutual collaboration among our various scientific societies and educational institutions. The labours of the committee of organisation and the transactions of the Congress together form a work of more than 3500 pages, representing a very precious collection of materials fer the history of the school question in Russia. The development of instruction in drawing decreed by the Government may be mentioned as one of the immediate practical results of the Congress. Among the papers presented to the Congress which attracted the greatest attention from their scientific merit we cannot pass over in silence the work upon middle and elementary professional technical schools by Mr Anopov, and that by Mr Korolkov upon the professional instruction of women in Russia.